

Panasonic®

Aicure LED Line Type UV Curing Systems
UD40 series (ANUD4S50)
User's manual

Precaution on safety

Precautions provided here are for prevention of hazards and damages to you and others by using the product safely and correctly.

In order to indicate the level of hazards, damages and the degree of urgency, contents of precautions that are presumed to occur in the case of erroneous handling are classified into "warning" and "caution." Both are important contents concerning safety, and hence must be observed without fail.

⚠ Warning Contents with presumed possibility of death or severe injury for people

⚠ Caution Contents with presumed risk of injury for people and occurrence of physical damage

Pictogram example



- Symbols indicate prohibited actions.
"Disassembly prohibited" in the picture to the left



- Symbols force or instruct actions.
"Observe without fail" in the picture to the left

Though we incorporate safety measures based on specification agreements, there is no guarantee from us whatsoever in the case of occurrence of safety issues.

Likewise, there is no guarantee from us whatsoever for production halt and product defect caused by equipment failure, malfunction, problem, etc., human and physical damage due to failure of other companies' merchandise equipped with the product, or related lawsuit and so forth.

Precaution on safety

 Warning	
 Prohibited	<p>Use appropriate transport device and stay away from the underside of machinery.</p> <ul style="list-style-type: none"> ◆ Use of inappropriate transport device may lead to dropping and causing injury.
 Prohibited	<p>Do not install this equipment near important electronic apparatuses supporting human life.</p> <p>Users of pacemaker and so forth must stay away from the device during operation.</p> <ul style="list-style-type: none"> ◆ Electromagnetic noises may cause errors in the function of life-support devices.
 Prohibited	<p>Do not use in combustible gas atmosphere.</p> <ul style="list-style-type: none"> ◆ It may result in explosion.
 Prohibited	<p>Do not throw this product into the flame.</p> <ul style="list-style-type: none"> ◆ It may cause explosion of electronic components.
 Prohibited	<p>Do not see or catch on skin the direct or reflected light of LED while it's on.</p> <ul style="list-style-type: none"> ◆ It may cause disorders and inflammation in the eye or the skin.
 Be sure to observe	<p>Set up the unit in such manner to avoid exposure of human body to LED-UV light.</p> <ul style="list-style-type: none"> ◆ Exposure to LED-UV light may cause disorders and inflammation in the skin. ◆ If there is a risk of exposure to LED-UV light and UV reflection, cover up with a shield with appropriate transmittance and thermal characteristics to block the UV light.
 Be sure to observe	<p>Be sure to wear protective glasses and protective gears when installing and operating.</p> <ul style="list-style-type: none"> ◆ Failure to wear them may cause disorders and inflammation in the eye or the skin. ◆ Be sure to wear protective glasses that shield UV lights since the light emitted by this machine contains UV light of either 365nm/385nm.
 Be sure to observe	<p>Be sure to perform cleaning of LED head while the power supply is cut off.</p> <ul style="list-style-type: none"> ◆ Performing with the power supply on may cause disorders and inflammation in the eye or the skin as well as electric shocks.
 Disassembly prohibited	<p>Do not disassemble or modify.</p> <ul style="list-style-type: none"> ◆ It may cause accidents, injuries and electric shocks. ◆ It may result in abnormal heating and fuming. ◆ It may cause disorders and inflammation in the eye or the skin due to exposure to LED-UV light.

Precaution on safety



	<p>Prohibited</p> <p>Do not put foreign objects such as liquid, flammables and metals inside the product.</p> <ul style="list-style-type: none">◆ It may result in abnormal heating and fuming.
	<p>Prohibited</p> <p>Do not perform work (connection, disconnection, etc.) while it is powered.</p> <ul style="list-style-type: none">◆ It may cause electric shocks.
	<p>Prohibited</p> <p>Do not put objects on top of this product or block the ventilation hole.</p> <ul style="list-style-type: none">◆ It may cause burnout due to heating.
	<p>Prohibited</p> <p>Do not touch with bare hands during radiation or right after radiation.</p> <ul style="list-style-type: none">◆ It may cause burns due to high temperature.
	<p>Be sure to observe</p> <p>Use this product with a margin against its guaranteed characteristics and performance.</p> <ul style="list-style-type: none">◆ Exceeding limit values of guaranteed characteristics and performance may result in breakage.
	<p>Be sure to observe</p> <p>Do not touch terminals when energized.</p> <ul style="list-style-type: none">◆ It may cause electric shocks.
	<p>Be sure to observe</p> <p>Connect wires and connectors securely.</p> <ul style="list-style-type: none">◆ Insufficient connection may result in abnormal heating and fuming.
	<p>Be sure to observe</p> <p>Do not use power input out of the specified range.</p> <ul style="list-style-type: none">◆ It may cause burnout.
	<p>Ground connection</p> <p>Connect the ground wire securely.</p> <ul style="list-style-type: none">◆ It may cause electric shocks and malfunctions.

Precaution on safety



Caution



Be sure to observe

Do not use in environments subject to major thermal fluctuation or occurrence of dewing.

- ◆ It may result in failures.



Be sure to observe

Do not use in environments subject to intense vibration or impact.

- ◆ It may result in failures.

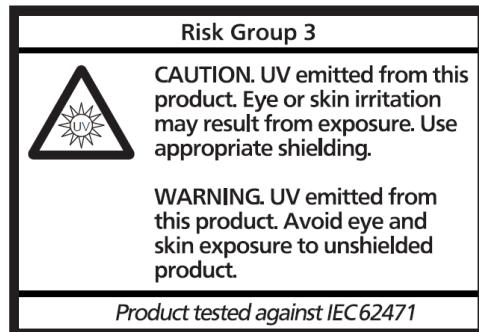
Usage Precautions

Standard on the safety of LED products

LED light source used in this product is the scope of application of "Photobiological Safety of Lamps and Lamp Systems (JIS C7550:2011, IEC62471:2006)."

Standard : JIS C7550:2011, IEC62471:2006

Classification : Risk group 3



However, we recommend safety management equivalent to Class 4 under "Standard on the safety levels of laser products" in consideration of safety for users.

<Reference: Standard on the safety levels of laser products>

Standard : IEC60825-1 Edition2.0:2007
JIS C6802:2011

Classification : Class 4 LED products
Wavelength : $365 \pm 10\text{nm}$, $385 \pm 10\text{nm}$

<Safety control items>

Do not see or catch on skin the direct or reflected light of LED while it's on.

(It may cause disorders and inflammation in the eye or the skin.)

Set up the unit in such manner to avoid exposure of human body to LED-UV light.

(Exposure to LED-UV light may cause disorders and inflammation in the skin. If there is a risk of exposure to LED-UV light and UV reflection, cover up with a shield with appropriate transmittance and thermal characteristics to block the UV light.)

Be sure to wear protective glasses (UV light blocking) and protective gears when installing and operating.
(Failure to wear them may cause disorders and inflammation in the eye or the skin.)

*Handling of LED products overseas

Though LEDs are currently excluded from the application of "Standard on the safety of laser products" under IEC and JIS as of current, older editions may be adopted in some countries and regions. Hence, please check the laser safety regulations and standards of the country of usage.

Usage Precautions

Read product specifications and user's manual thoroughly before usage and use it correctly.

1. Take external safety measures (interlocking, installation of smoke detector, etc.) so that a fail-safe mechanism will work for the entire system in the case of product failures or errors caused by external factors.

2. Do not disassemble or modify. It may result in failures.

Warranty will be void for failure or breakage occurring from usage with disassembly and modification.

3. Power source voltage for this device is single phase, 200 to 240V AC (frequency of 50 to 60Hz). Do not use it on power source voltage and frequency deviating the provision in this manual. It may cause breakage.

4. Customers shall prepare the power cable (AC supply cable) with the diameter appropriate for the maximum input current (5A).

5. Securely connect the power cable to the terminal block (screw diameter ø4) on the back of the control unit.

6. Connect the ground wire securely.

7. Do not share the power line for this product with motors, machines with induction properties, or devices that consume large amounts of power.

8. Despite the sufficient resistance to noises superimposed on the power line, it is recommended to use an isolation transformer and so forth to attenuate noises before feeding the power.

9. Use the supplied cables for the connections among the control unit, power unit, and LED head. Make sure that the cables are connected securely.

Warranty will be void for failure, breakage or destruction occurring from usage of products other than what's designated or recommended by us.

10. When connecting cables to D-Sub37 connector for external I/O, perform soldering accurately to prevent short circuits between the terminals inside the connector.

11. When connecting an inductive load (motor or relay) to the external I/O, connect a noise absorber (noise killer and so forth) to the load side.

12. After finishing the connections of the power cable (AC supply cable), securely screw the terminal block cover to prevent electric shocks.

13. Hold the connector (plug) area when connecting/disconnecting the cables.

14. Wire the cables in such manner to avoid load and stress to the cables and connectors.

15. Place the rubber feet on a horizontal surface.

Do not install in tilted, sidelong, or flipped positions. It may cause breakage due to occurrence of heating.

16. Do not install in a sealed space.

17. Do not block the ventilation hole of the power unit.

18. Please have a margin to installation space, and do not allow the exhaust air from the fan to enter through the air intake.

19. Check that all the connections are correct before turning on the power.

20. Installation environment:

- Ambient temperature 0 to +35 °C
- Ambient humidity 30 to 85%RH (at 25°C, no dewing or freezing)
- A place free from dust, oil smoke, conductive dust, corrosive or flammable gas, salt content, and iron dust
- A place free from splashes of water, oil and chemicals
- A place free from sudden temperature changes, vibration and shocks
- A place free from direct sunlight
- A place free from high magnetic field and intense electric field

Usage Precautions

Warranty

Products and specifications described in this document are subject to change without notice for product improvement and so forth (including specification changes and discontinued production). Upon considering using these products or placing orders, please check whether the information provided in this document is up to date by contacting our inquiry desk as necessary.

Though we make utmost efforts on quality control of this product,

1. we would like to ask you to consult our inquiry desk and exchange specification documentation in the case that the application may entail usage beyond the range of specifications, environments and conditions provided in this document or in the case of applications requiring especially high reliability such as usage under conditions and environments not prescribed or safety devices and control systems such as railways, aviation and medical use.
2. In order to prevent the occurrence of unexpected troubles regarding matters not provided in this document, please consult about the specifications of your product, its customers, usage condition for this product, details on the area this product is mounted, etc.
3. Take external safety measures such as a redundant circuit so that a fail-safe mechanism will work for the entire system in the case of product failures or errors caused by external factors. Please use this product with a margin against the values of its guaranteed characteristics and performance as provided in this document.
4. Please perform acceptance inspection with purchased or delivered articles in a timely manner and also carry out the handling of this product before and during the acceptance inspection with sufficient consideration on controlled maintenance.

Warranty period

In the case of failures for which we are to be held responsible within 1 year from technical acceptance, we will perform the repair or provide the parts free of charge.

However, warranty period shall be 1 year from accounting acceptance in the case that technical acceptance is not performed within 15 days from accounting acceptance due to reasons on your side or that the article about deeming accounting acceptance as technical acceptance out of articles concerning accounting acceptance prescribed on product specification sheet is to be applied.

Warranty coverage

In the case of failure or flaw with this product revealed during the warranty period for which we are to be held responsible, we will provide substitute articles or required replacement parts or replace or repair the flawed part free of charge.

However, failures and flaws corresponding to the following will be excluded from the scope of this warranty.

1. If it is due to the specifications, standards, handling methods, etc. ordered by you.
2. If it is caused by modifications on the structure, performance, specifications, etc. performed after purchase or after delivery without any involvement from us.
3. If it is due to a phenomenon that cannot possibly be foreseen by the technology made available at the time of the purchase or contract.
4. If the usage deviated from the range of conditions and environments prescribed in the catalog, specification sheet, and user's manual.
5. In the case of damages that could be avoided if your devices, into which this product is integrated for use, retain functions and structures that should naturally be equipped by common sense in the industry.
6. If it is due to natural disasters, infliction by a third party, or an act of God.
7. If the failure is due to specifications deviating from power source specification recommended by us or the power source.
8. Other cases where our responsibility is not clarified through failure analysis.
9. If the device is damaged due to corrosion caused by poisonous gases in the vicinity.
10. In the case of occurrence due to use of products not designated or recommended by us.
11. In the case of occurrence due to usage with disassembly and modification.
12. If it is caused by relocation from the original position at the time of technical acceptance.
13. If it is due to scratches, damages, erroneous connection, or erroneous setup upon assembling the apparatus.
14. If it is used without performing appropriate maintenance.
15. In the case of minor performance change that can be compensated by output adjustment and so forth.
16. Concerning consumables and secondary materials such as filter.
17. Other cases where free warranty is not granted based on our judgment.

The warranty as mentioned herein is limited to the warranty on the sole unit of this purchased or delivered product, and damages brought about due to failures or flaws of this product will be excluded.

This warranty is applied to the application at the time of purchase. Please contact us when changing the application or relocating abroad.

Location to which free services are applicable

Final delivery address in Japan designated at the time of order or location of your staff in charge of this device in Japan.

Usage Precautions

Warranty

Handling of overseas relocation

If this device is taken outside of Japan by the hands of you or final users, the scope of 12-month free services will only include provision of replacement parts to the designated domestic location and free repair on the device sent to us, and on-location support by us or local agents will be provided for a fee.

Production warranty

Losses due to production halt caused by failures of this device and losses incurred due to defects will not be compensated.

Safety warranty

Make sure to perform any maneuver such as maintenance or trouble shooting where human body parts such as hands and fingers touch the equipment after shutting down the power source. It may lead to electric shocks or other disasters. Though safety covers and switches will be installed in line with directions from you based on specification agreements, safety issues occurring during usage will not be guaranteed by us.

Responsibility for flaws

Flaws of the device resulting from the specifications, standards, handling methods, etc. ordered by you will not be guaranteed.

Responsibility due to usage methods deviating from specifications

If due to usage method deviating from specifications, there will be no warranty on safety, environment, device, etc. nor any warranty on the resulting problems.

Also, device troubles caused by this will be excluded from the warranty regardless of the warranty period.

Warranty on LED head

Warranty on the LED head will, in contrast to the warranty for this product (UD40 controller), be in accordance with the content of the specification sheet and manual for the LED head.

Table of Contents

Safety Precautions	2
Usage Precautions	6
1) Device overview	
1. Function overview description	11
2. Features	11
3. Device configuration	11
4. Basic specifications	12
5. Outline drawing	14
2) Installation of device	
1. Installation environment	17
2. Work at your expense	17
3. Installation of device	17
4. Space for installation	18
5. Wiring method	19
6. Primary power source connection	20
7. Wiring	20
3) Names and functions of each part	
1. Control unit	21
2. Power unit	22
3. LED head	23
4) Touch screen	
1. Touch screen display	24
2. Description on touch screens and switching between screens	24
5) Operation of device	
1. LOCAL / REMOTE common items	25
2. Data menu	27
3. Program setup	28
4. Manual operation	29
5. Operation by external signal	30
6) Error display	
1. Error display	35
2. Error items and contents	35
3. Emergency stop	37
7) Maintenance list	
8) Troubleshooting	39
9) Manual revision history	40

1) Device overview

1. Function overview description

This device is an ultraviolet hardening device that swiftly hardens UV resins (ink, adhesive & paint) by radiating ultraviolet from its LED light source.

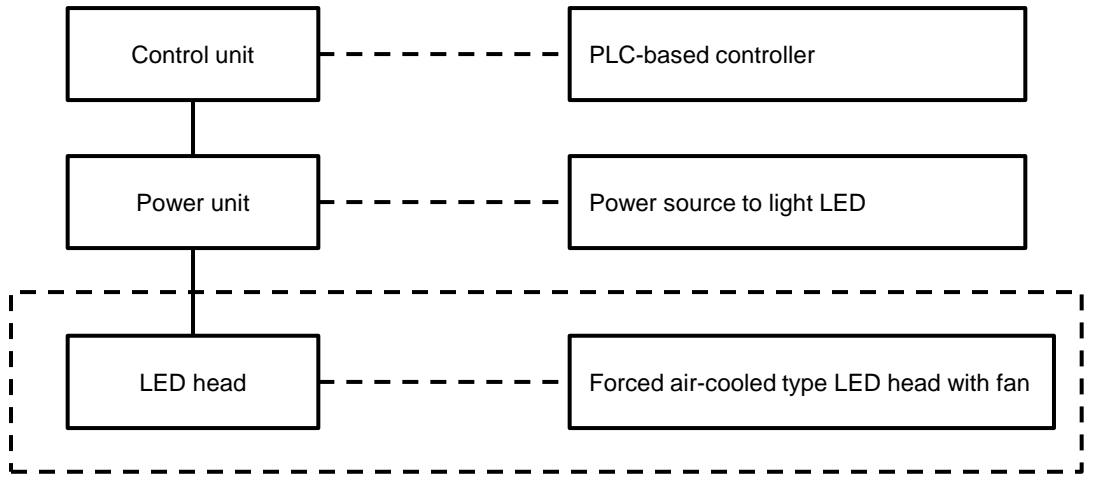
UV radiation onto objects in various radiation widths is made possible by freely changing the radiation area.

2. Features

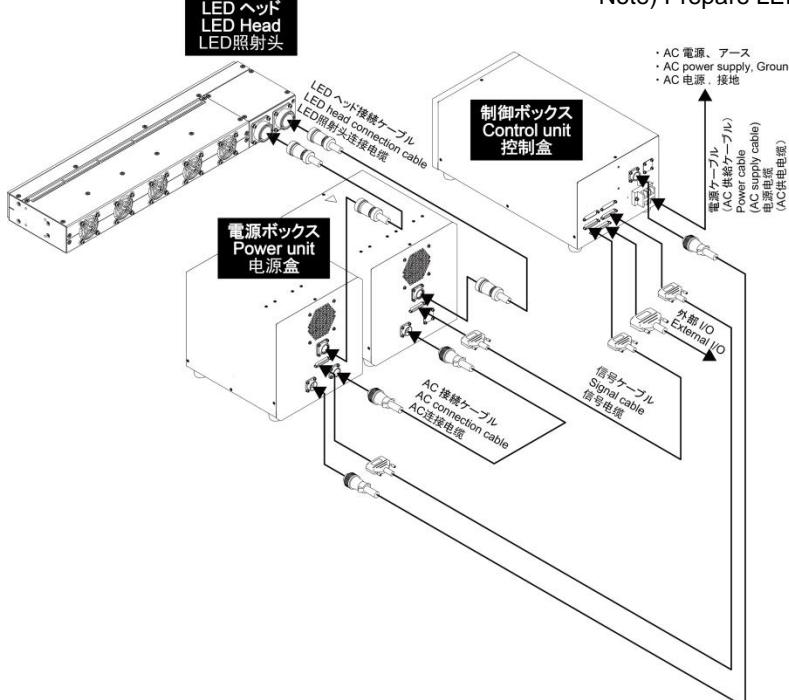
1. Major reduction in power consumption: Power consumption can be kept low in comparison to conventional lamp type.
2. With forced cooling with a fan, it requires no such equipment as chillers for LED cooling.
3. Extensive size variation is available.
4. Flexible UV radiation is possible.
5. Exhaust duct is not required, contributing to maintaining a clean environment.
6. Low-temperature radiation containing no infrared reduces thermal impact on the object.
7. Downsized power unit and absence of exhaust blower save space.
8. Lifetime is longer than conventional lamp-type UV lamp reducing the burden of maintenance.

3. Device configuration

This devices consists of the control unit, power unit, and LED head (radiation unit).



Note) Prepare LED head separately.



1) Device overview

4. Basic specifications

Controller part number		ANUD4S50	
Power unit type	Power unit - 1	ANUD4P32N	
	Power unit - 2	ANUD4P21X	
Number of LED head blocks to be handled		5 blocks	
Part number of corresponding LED head	λ : 365nm	ANUD4A511	
	λ : 385nm	ANUD4B511	
Rated	Input power supply voltage	Single phase AC 200 to 240V	
	Input power supply frequency	50 to 60Hz	
	Maximum input current	5A	
	Maximum power consumption	550W	
Performance	Number of radiation program patterns		32 patterns ^{*1}
	Display / setting / operation		Display / setting / operation from touch screen
	External control	Type	Parallel I/O (D-Sub37 ^{*2})
		External input	LED lighting / program selection / individual LED block lighting Local-remote switching / external emergency stop
		External output	Equipment power ON / LED radiation ready / during radiation / warning / Error Main unit emergency stop
	Dimming control ^{*1}		50% to 100% (in increments of 1%)
	LED temperature feedback		Function to detect LED head temperature to stabilize UV output
	Peak radiation intensity ^{*3}	Radiation distance: 10mm	4,200mW/cm ² (at 365nm) / 4,600mW/cm ² (at 385nm)
		Radiation distance: 30mm	2,300mW/cm ² (at 365nm) / 2,600mW/cm ² (at 385nm)
	Effective radiation width ^{*3}	Radiation distance: 10mm	36mm (with 1-block radiation), 108mm (with consecutive 2-block radiation) 180mm (with consecutive 3-block radiation) 252mm (with consecutive 4-block radiation) 324mm (with full-block radiation)
		Radiation distance: 30mm	16mm (with 1-block radiation), 88mm (with consecutive 2-block radiation) 160mm (with consecutive 3-block radiation) 232mm (with consecutive 4-block radiation) 304mm (with full-block radiation)
	Speculated LED head life ^{*3}		15,000 hours (at the point of 70% against initial UV intensity)
Circumstantial	Operating ambient temperature		0 to +35°C
	Operating ambient humidity		30 to 85%RH (at 25°C, no dewing or freezing)
	Storage ambient temperature		-10 to +60°C
	Storage ambient humidity		30 to 85%RH (at 25°C, no dewing or freezing)

*1 To be set from touch screen.

*2 Customers shall prepare the cable to be connected to D-Sub37 connector.

*3 By our measurement standards. Representative value, not guaranteed value.

Check the specification sheet and manual of LED head for basic specifications of the LED head itself.

1) Device overview

Structure	Configuration		Control unit equipped with PLC, power supply for LED lighting Separate type radiation unit equipped with UV-LED
	AC inlet		Terminal block (screw diameter of terminal block: ø4)*4
	Cooling method	Control unit	Fan-less natural air-cooling
		Power unit	Forced air-cooling with fan
		LED head	
	Outer surface finish	Control unit	Matte black coat
		Power unit	
		LED head	A5052 cover (black anodized finish)
	Size*5	Control unit	W × H × D=280mm × 222.2mm × 560mm
		Power unit	W × H × D=280mm × 301mm × 326mm
		LED head	W × H × D=50mm × 477mm × 142mm
	Weight*6	Control unit	Approx. 15kg
		Power unit - 1	Approx. 14kg
		Power unit - 2	Approx. 12kg
		LED head	Approx. 3.5kg
Outline drawing		See P.14 to 16	
Miscellaneous	Space for installation		See P.18
	Wiring type		See P.19
	Included items	Control unit	Power keys, D-Sub37 connector
		Power unit	Signal cable, AC connection cable, LED head connection cable
		LED head	Connector for power source wiring (NJW-2824-PF16, NJW-2824-PFX16)*7

*4 Customers shall prepare the power cable (AC supply cable) with the diameter appropriate for the maximum input current (5A).

*5 Excluding protruding parts of connectors and cables

*6 Excluding connectors and cables

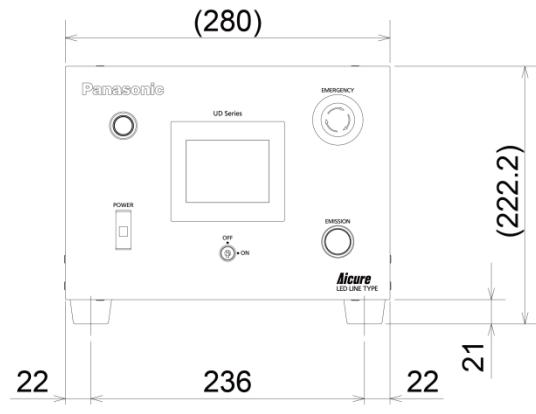
*7 If the LED head is purchased together with the controller, the LED connection cable accompanying the controller will be used, and the power wire connector included in LED head will not be used.

1) Device overview

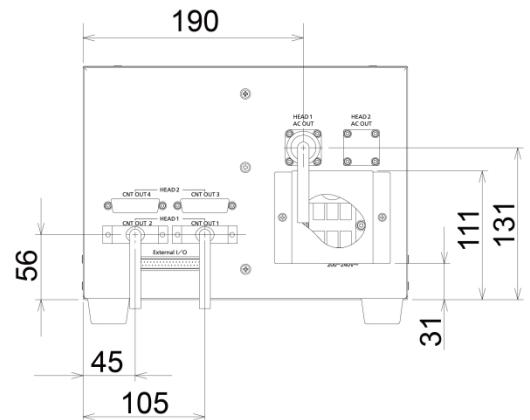
5. Outline drawing (unit: mm, protrusions not included)

●Control unit

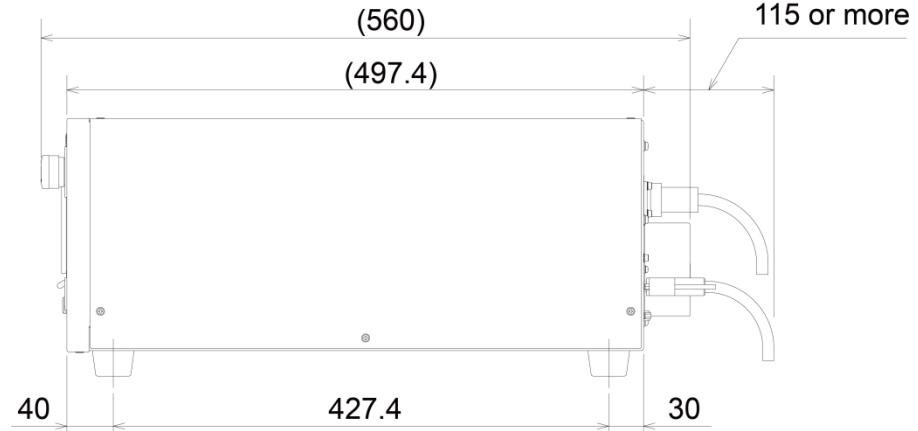
【正面図】
[Front view]



【背面図】
[Back view]



【側面図】
[Side view]



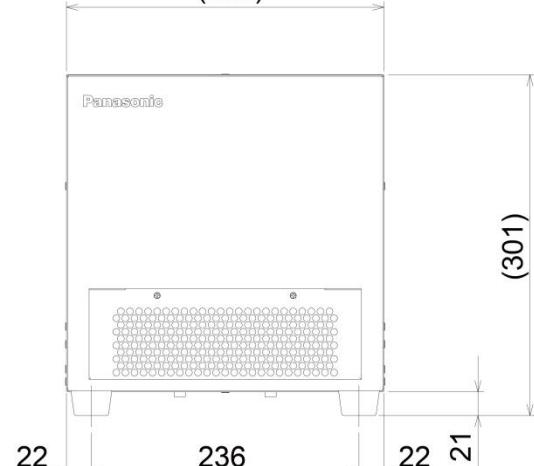
1) Device overview

● Power unit

【正面図】

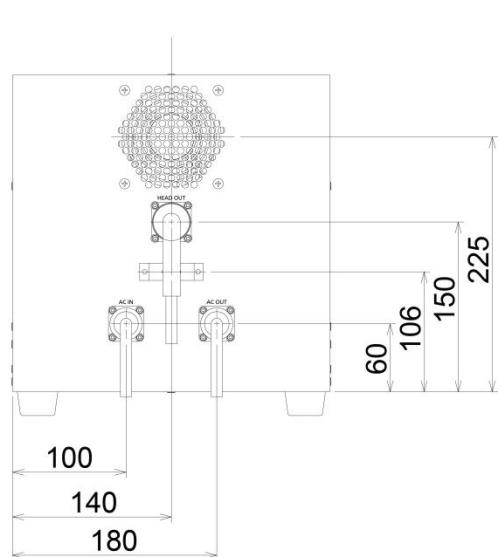
[Front view]

(280)



【背面図】

[Back view]

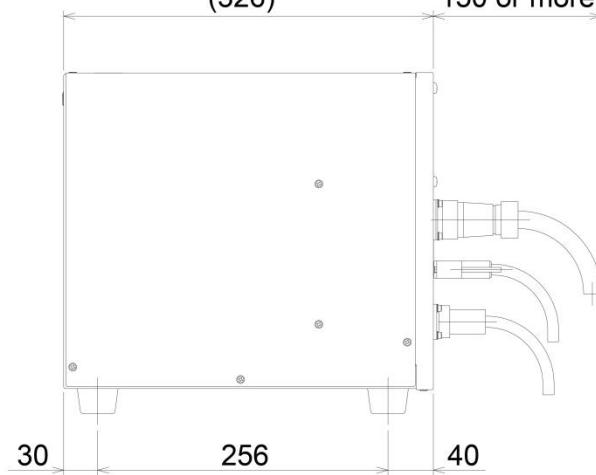


【側面図】

[Side view]

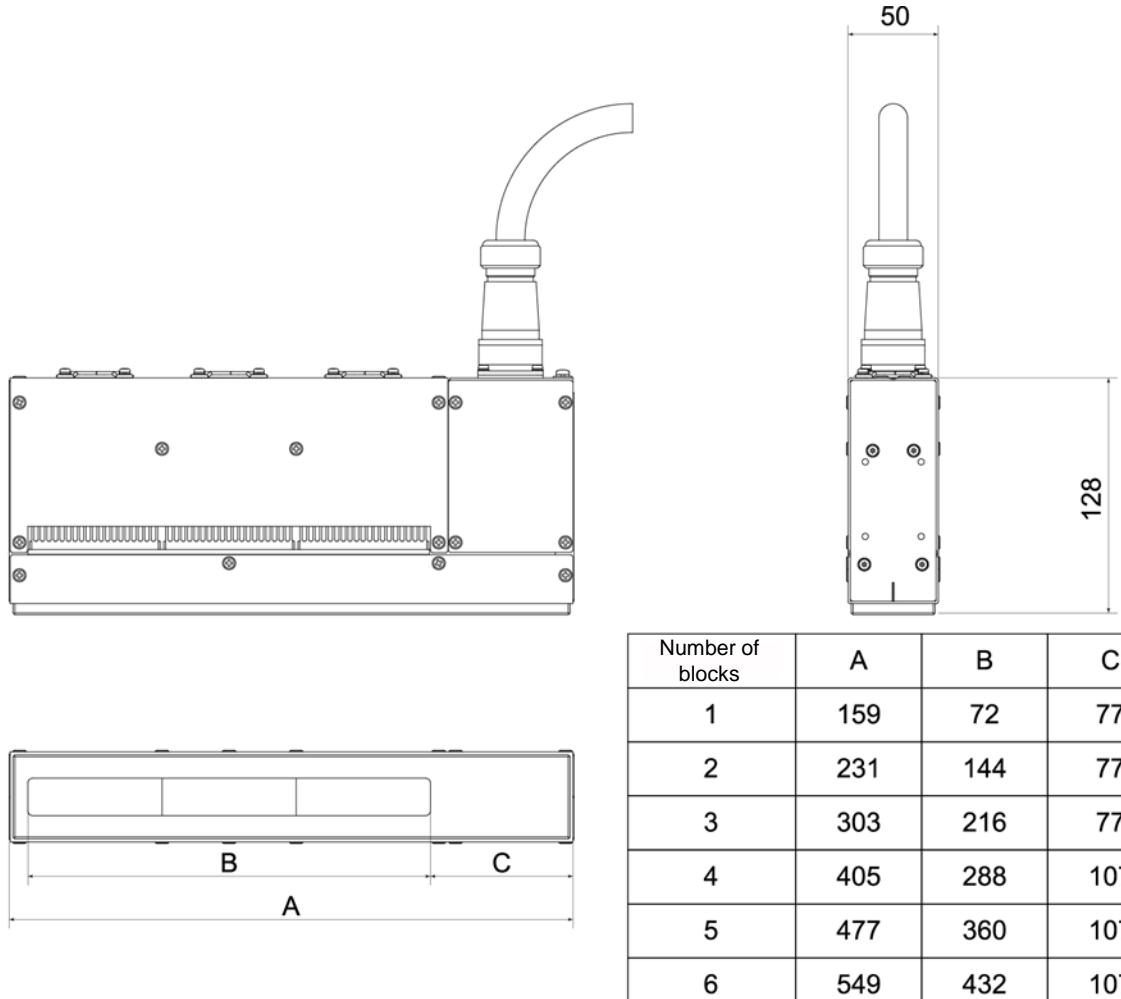
(326)

150以上
150 or more



1) Device overview

- LED head



- Outline dimension drawing shown above is an example of the 3-block version.
Please refer to the table for dimensions A-C.
- Products with 4-6 blocks will have 2 connectors to be connected to the main unit.

2) Installation of device

1. Installation environment

- 1.Ambient temperature: 0 to +35°C, ambient humidity: 30 to 85%RH (at 25°C), no dewing or freezing
- 2.Must be a place free from dust, oil smoke, conductive dust, corrosive or flammable gas, salt content, and iron dust.
- 3.Must be a place free from splashes of water, oil and chemicals.
- 4.Must be a place free from sudden temperature changes, vibration and shocks.
- 5.Must be a place free from direct sunlight.
- 6.Must be a place free from high magnetic field and intense electric field.

2. Work at your expense

- 1.Installation and wiring work with device at installation location
- 2.Power source to feed to device and related wiring work
 - Primary power supply work
- 3.Works other than what is prescribed as work to be done at our expense on estimate sheet

3. Installation of device

[Control unit, power unit]

- 1.Place the rubber feet on a horizontal surface.
- 2.Do not install in tilted, sidelong, or flipped positions.
It may cause breakage due to occurrence of heating.
- 3.Do not install in a sealed space.
- 4.Do not block the ventilation hole of the power unit.
- 5.Please have a margin to installation space, and do not allow the exhaust air from the fan to enter through the air intake.
- 6.Take external safety measures (interlocking, installation of smoke detector, etc.) so that a fail-safe mechanism will work for the entire system in the case of product failures or errors caused by external factors.

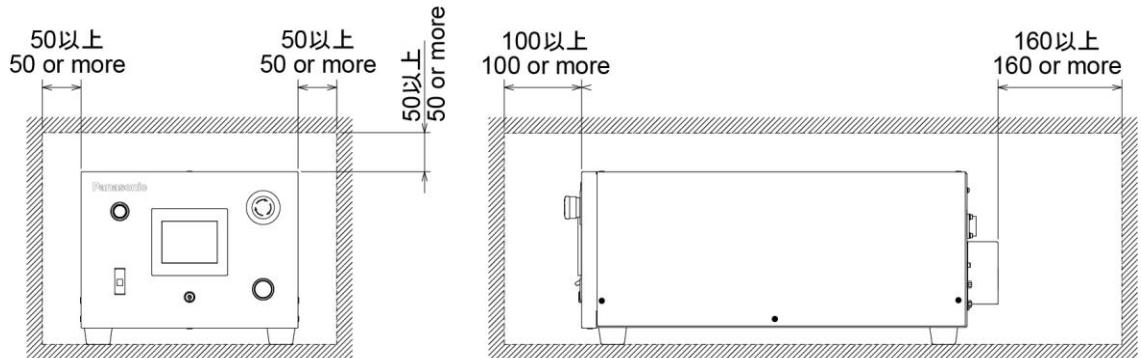
[LED head]

- 1.Do not block the ventilation hole.
It may result in abnormal heating.
- 2.Do not touch the radiation window (glass) with bare hands.
It may cause taint.
- 3.UV radiation unit (radiation window) is protected by glass.
Impact to this area may cause breakage of glass.
Stains in this area may reduce UV output intensity.
Wipe taint, if any, with alcohol (ethanol, IPA) thoroughly.
- 4.See the LED head specification sheet, user's manual, etc. for details needed for appropriate installation.

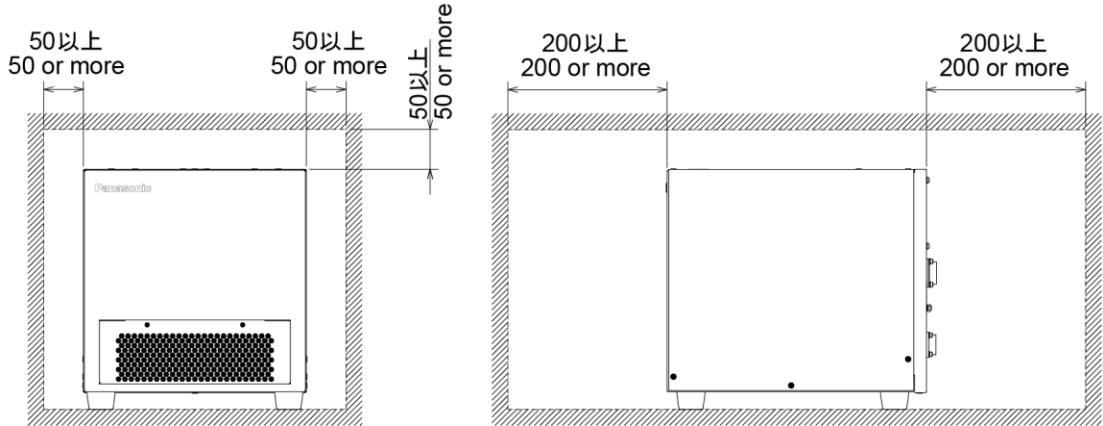
2) Installation of device

4. Space for installation

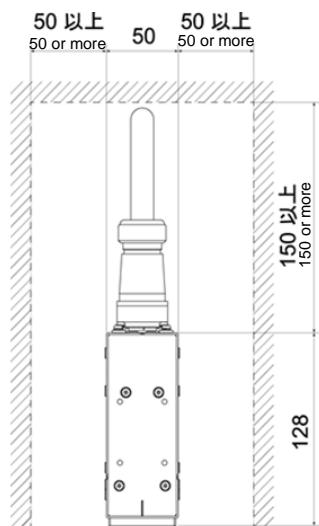
● 制御ボックス Control unit



● 電源ボックス Power unit



● LED head



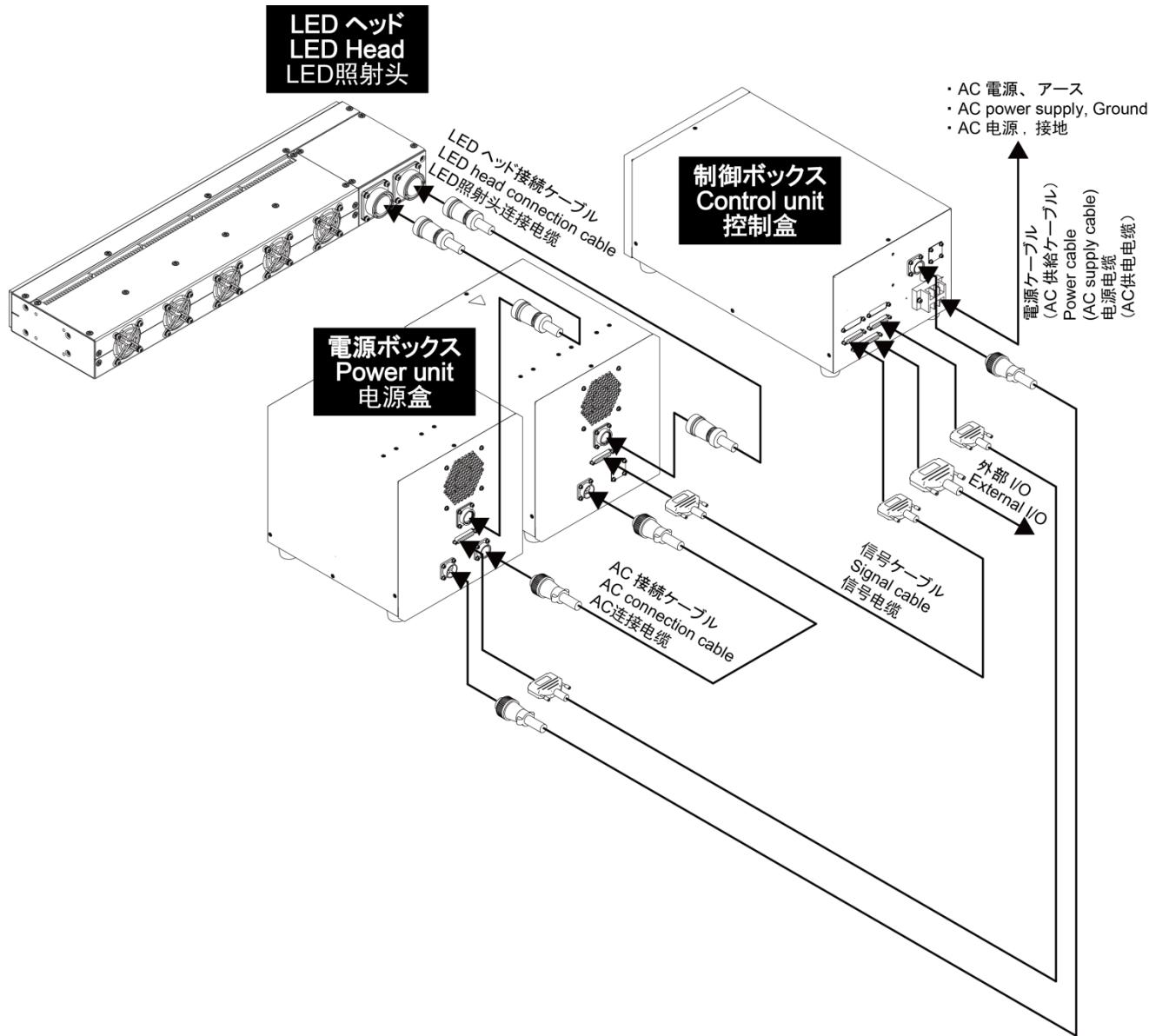
Do not install the control unit, power unit, and LED head in a sealed space.

Please have a margin to installation space, and do not allow the exhaust air from the fan to enter through the air intake. Perform installation of LED head to customer's equipment securely using total of 8 pieces of M4 screws on the side faces of the head. (Standard tightening torque: 1.0N·m)

See the LED head specification sheet and installation work description documents for details on LED head installation needed for appropriate installation.

2) Installation of device

5. Wiring method



- Use the supplied cables for the connections among the control unit, power unit, and LED head. Make sure that the cables are connected securely.
- Customers shall prepare the power cable (AC supply cable) with the diameter suited to withstand the maximum input current (5A).
- Use AWG #20 to 28 wires for the cable to D-Sub37 connector for external I/O and perform soldering accurately to prevent short circuits between the terminals inside the connector.

2) Installation of device

6. Primary power source connection

1. Supply single phase 200V to 240V (frequency of 50Hz to 60Hz) for power source voltage.
2. Customers shall prepare the power cable (AC supply cable) with the diameter appropriate for the maximum input current (5A).
3. Securely connect the power cable to the terminal block (screw diameter ø4) on the back of the control unit.



Make sure the primary power is cut off when connecting. It may cause electric shocks.

Be sure to observe

4. Be sure to connect the power ground wire.



Usage without ground connection may lead to electric shocks and device troubles.

Ground connection

5. After finishing the connections of the primary power source, securely screw the terminal block cover to prevent electric shocks.
6. Do not share the power line for this product with motors, machines with induction properties, or devices that consume large amounts of power.
7. Despite the sufficient resistance to noises superimposed on the power line, it is recommended to use an isolation transformer and so forth to attenuate noises before feeding the power.

7. Wiring

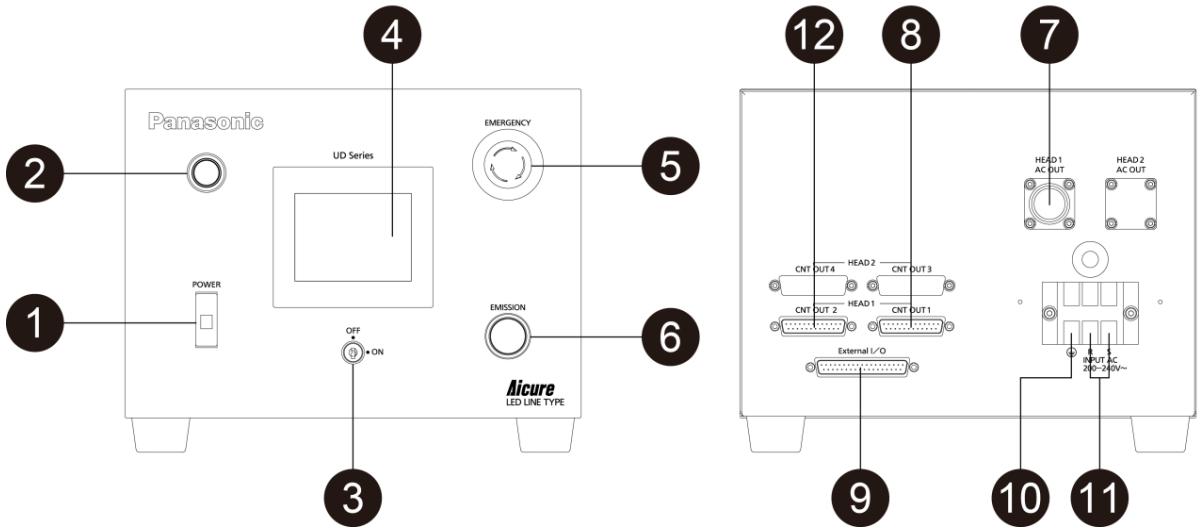
1. Use the supplied cables for the connections among the control unit, power unit, and LED head.

See P.19 for reference, and make sure that the cables are connected securely.

1. Use AWG #20 to 28 wires for the cable to D-Sub37 connector for external I/O and perform soldering accurately to prevent short circuits between the terminals inside the connector.
2. When connecting an inductive load (motor or relay) to the external I/O, connect a noise absorber (noise killer and so forth) to the load side.
3. Hold the connector (plug) area when connecting/disconnecting the cables.
4. Wire the cables in such manner to avoid load and stress to the cables and connectors.
5. Due to the external emergency stop function, this device cannot be used without #17 and #18 pins of external I/O connector being shorted.
6. Use dry contacts for the wiring to short #17 and #18 pins of external I/O connector.

3) Names and functions of each part

1. Control unit

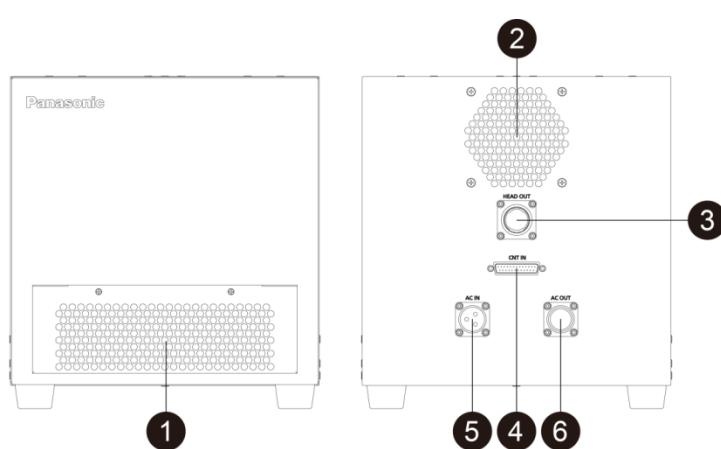


Name	Function
(1) Circuit breaker	AC power is supplied to the equipment.
(2) Pilot lamp	When AC is supplied and the breaker is on, the light stays on.
(3) Key switch	The equipment can be started or stopped.
(4) Touch screen	Each setting and display are available.
(5) Emergency stop switch	This starts an emergency stop and stops UV radiation. To recover from an emergency stop, follow instructions provided on the touch screen.
(6) Radiation switch / Radiation underway lamp	This switch starts or stops UV radiation in manual mode. During UV irradiation, red light stays on.
(7) AC supply connector	Connector for AC power supply to power unit - 1 Connects to "AC IN" of power unit - 1.
(8) Power unit communication connector - 1	Connector for communication with power unit - 1 Connects to "CNT IN" of power unit - 1.
(9) External I/O connector	For connection with external apparatuses such as PLC (See P.30 for connector pin numbers and signal content.)
(10) Grounding terminal	Terminal for ground wire connection (screw diameter of terminal block: ø4)
(11) AC power receiving terminal	Terminal for AC 200 to 240V connection (screw diameter of terminal block: ø4)
(12) Power unit communication connector - 2	Connector for communication with power unit - 2 Connects to "CNT IN" of power unit - 2.

3) Names and functions of each part

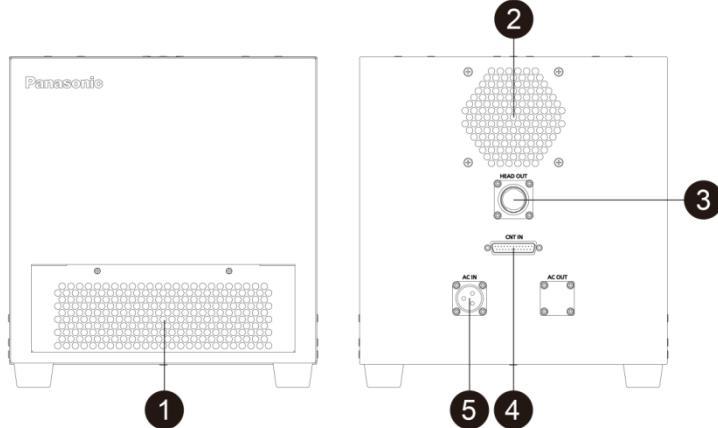
2. Power unit

- Power unit - 1



Name	Function
(1) Air intake	Air intake for cooling the power unit. The anti-dust filter is inside the panel.
(2) Exhaust port	Exhaust opening for discharging heat produced inside the power unit.
(3) LED head connection connector	For connection with LED head
(4) Power unit communication connector	Connector for communication with control unit Connects to "HEAD1 CNT OUT 1" of control unit.
(5) AC power receiving connector	Connector for reception of AC power Connects to "HEAD1 AC OUT" of control unit.
(6) AC power transmission connector	The connector allows AC power to be supplied to the second power unit. Connects to "AC IN" of power unit - 2.

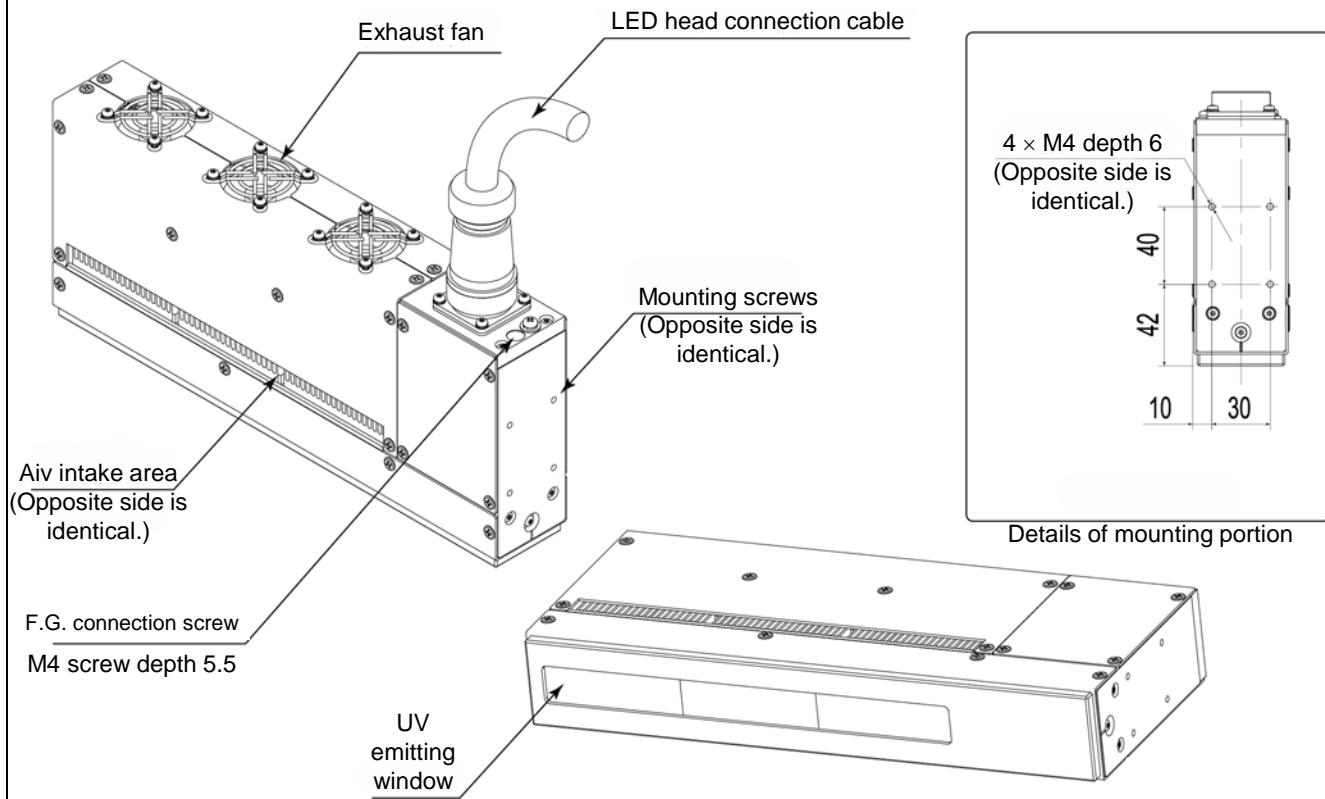
- Power unit - 2



Name	Function
(1) Air intake	Air intake for cooling the power unit. The anti-dust filter is inside the panel.
(2) Exhaust port	Exhaust opening for discharging heat produced inside the power unit.
(3) LED head connection connector	For connection with LED head
(4) Power unit communication connector	Connector for communication with control unit Connects to "HEAD1 CNT OUT 2" of control unit.
(5) AC power receiving connector	Connector for reception of AC power Connects to "AC OUT" of power unit - 1.

3) Names and functions of each part

3. LED head



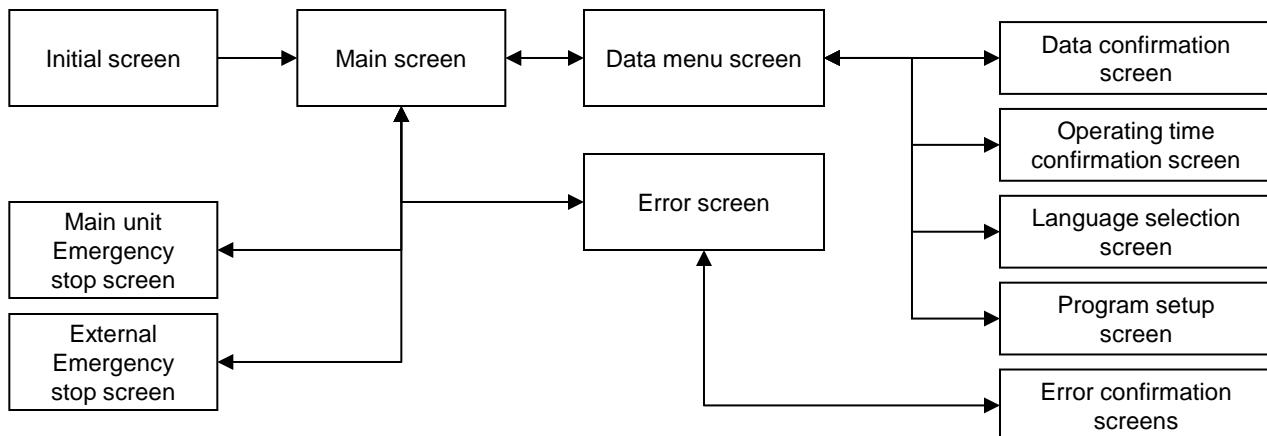
Outline drawing of 3B version is shown as an example of LED head.

See the LED head specification sheet and installation work description documents for details.

4) Touch screen

1. Touch screen display

The following screens are displayed on the touch panel.



2. Description on touch screens and switching between screens

1. Initial screen

Turn ON control unit circuit breaker to display the initial screen as shown to the right after touch screen initialization is complete.

In the language of the inverted state by pressing the switch of the language selection, , the touch panel is displayed.

PLC software version is shown in the bottom right corner of screen.

2. Startup preparation screen

Turn ON the key switch to jump to startup preparation screen and start initialization of the device.

Switches to main screen upon completion of startup preparations.

3. Main screen

Various switches are displayed. Major ones include the following:

- Temperature Feedback ON / OFF
Switch for activation of detection of LED head temperature to stabilize UV intensity
- Data menu
Switches to data menu screen.
- LED wavelength 365nm / 385nm
Displays LED wavelength of connected LED head.
- LOCAL / REMOTE
Displays control type of UD40 controller.
LOCAL : Manual operation is possible from control unit.
REMOTE: Controlled by signal input to external I/O connector.
- Program No.
Displays selected program No.
When LOCAL : Modification is possible by touching the number field.
REMOTE : Displays program No. set by external signal.
- LED head
Displays lit LED blocks as illustrated in the bottom left corner of screen.

Panasonic

Aicure LED Line Type UV Curing System
UD40 Series Controller

Turn ON the Key Switch

言語選択 / Language select / 语言选择

Ver. *, **

Initial screen

Panasonic

Aicure LED Line Type UV Curing System

UD40 Series Controller

Startup preparations

言語選択 / Language select / 语言选择

Ver. *, **

Startup preparation screen

UD40 Series

LED wavelength 365nm
Program No. * *

		LOCAL					
		1	2	3	4	5	6
LED HEAD	1	2	3	4	5	6	

Temp. Feedback OFF



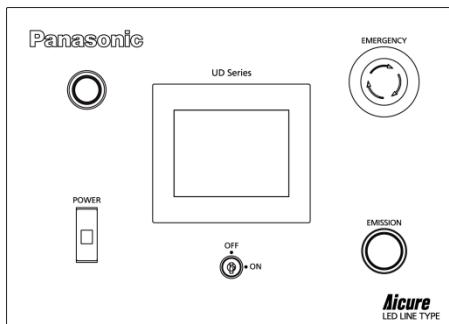
LED ON
LED OFF

Data Menu

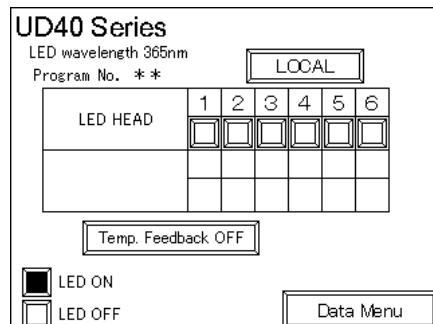
Main screen

5) Operation of device

1. LOCAL / REMOTE common items



Front panel



Main screen

(1)"EMERGENCY" switch

Press this switch to turn the device into emergency stop, jump to main unit emergency stop screen, and stop UV radiation.

Follow the procedure displayed on touch screen to resume from emergency stop state.

EMERGENCY STOP

Turn the knob of the emergency stop button to the right direction, please press the "RESET"

RESET

中文

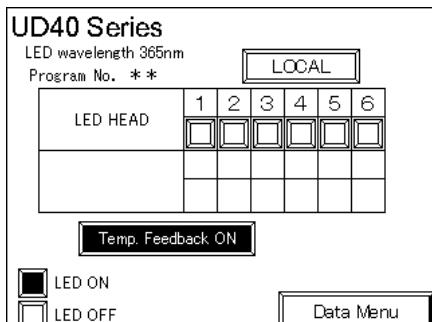
Main unit emergency stop screen

(2)"Temperature feedback ON / OFF" key

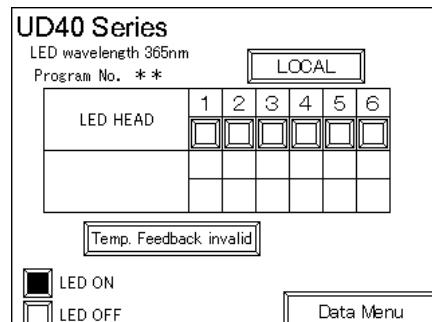
By pressing this key and achieving "temperature feedback ON," the function to detect LED head temperature and stabilize UV intensity will be activated.

However, this function will be deactivated even under "temperature feedback ON" if the dimming rate is set to 100% in program setting screen as in P.28.

Also, this function will be deactivated if the dimming rates are not identical for all the blocks of LED head.



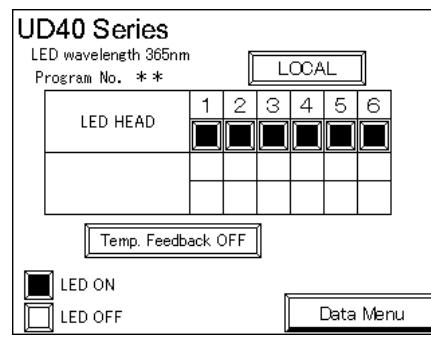
Temperature feedback ON state



Temperature feedback invalid state

(3)"LED head" status display area

Displays lit LED blocks while LED radiation is on, as illustrated in the bottom left corner of screen.



UV radiation underway screen

(4)"Data menu" key

Press this key to jump to data menu screen.

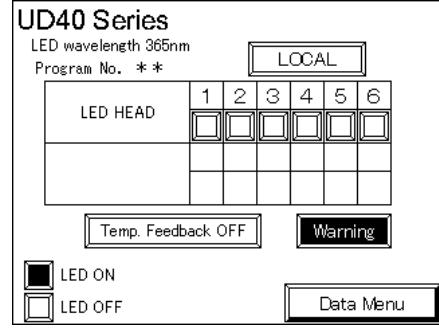
See P27 for details.

5) Operation of device

(5) Warning display

"Warning" message appears on screen when LED lighting time and fan working time come close to the preset lifetime.

Press this area when this message is displayed to jump to "operating time confirmation" screen, where details of the warning can be checked.



Data menu screen

Block No. of LED and fan approaching preset lifetime will be displayed inversed and blinking.

Please contact our inquiry desk as the LED and fan will soon need to be replaced.

Confirmation of operating time			
No.	LED lighting time	No.	Fan operation time
1	***** . * hour	1	***** . * hour
2	***** . * hour	2	***** . * hour
3	***** . * hour	3	***** . * hour
4	***** . * hour	4	***** . * hour
5	***** . * hour	5	***** . * hour
6	***** . * hour	6	***** . * hour

LED life is approaching
Fan life is approaching
Contact the manufacturer Contact the manufacturer

ESC

Operating time confirmation screen

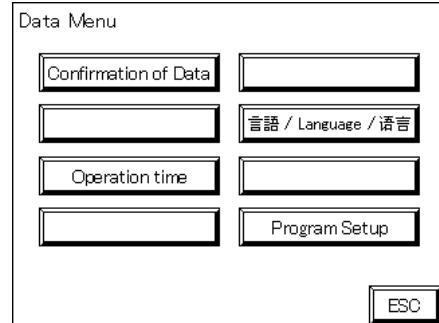
5) Operation of device

2. Data menu

Press "data menu" key on main screen to jump to data menu screen.

Description on each key

Press the keys on touch screen to switch screens and carry out the following confirmation, settings, and actions.



Data menu screen

(1) Data confirmation screen

This screen displays the dimming rate of the selected program No. as well as LED temperature of each block of the current LED head.

It is also possible to switch temperature feedback ON/OFF on this screen.

Confirmation of Data		
Program No. ** Temp. Feedback OFF		
No.	Dimming rate	LED Temperature
1	*** %	** . * °C
2	*** %	** . * °C
3	*** %	** . * °C
4	*** %	** . * °C
5	*** %	** . * °C
6	*** %	** . * °C

LED ON LED OFF ESC

Data confirmation screen

(2) Operating time confirmation screen

This screen allows confirmation of lighting time of LED on each block of the LED head as well as working time of the fan.

Confirmation of operating time			
No.	LED lighting time	No.	Fan operation time
1	***** . * hour	1	***** . * hour
2	***** . * hour	2	***** . * hour
3	***** . * hour	3	***** . * hour
4	***** . * hour	4	***** . * hour
5	***** . * hour	5	***** . * hour
6	***** . * hour	6	***** . * hour

ESC

Operating time confirmation screen

(4) Language selection screen

In this screen, can switch the display language on the touch panel.



Language selection screen

(4) Program setup screen

Dimming rate of LED when lit can be set in this screen.

Details will be explained in the next section.

(5) "ESC" key

Press this key to go to the previous screen.

5) Operation of device

3. Program setup

Press “program setup” key on data menu screen to jump to program setup screen.

LED head lighting conditions can be set in this screen.

Description on each key

The following confirmation and settings will be enabled by pressing the keys on touch screen.

Program Setup		Program Nb. * *	
<input type="button" value="←"/>	<input type="button" value="→"/>		
No.	LED HEAD	No.	
1	<input type="checkbox"/>	*** %	%
2	<input type="checkbox"/>	*** %	%
3	<input type="checkbox"/>	*** %	%
4	<input type="checkbox"/>	*** %	%
5	<input type="checkbox"/>	*** %	%
6	<input type="checkbox"/>	*** %	%

Turn on the LED
 Turn off the LED

Program setup screen

(1) “←” and “→” keys

Press these keys to modify program No.

Program No. takes the range of 0 to 31, and turns to “31” when “←” is pressed in the state of “0” and turns to “0” when “→” is pressed in the state of “31.”

Also, the set dimming rate for each LED block corresponding to the program No. will be displayed on screen, and if the set dimming rate appears as “0%,” that LED block is set to not illuminate the LED.

(2) Dimming rate input screen

Keyboard pops up on screen by touching the number field of the set dimming rate on screen, allowing entry of dimming rate.

Keyboard allows entry of dimming rate of 0% and 50 to 100%, which will be determined by pressing “ENT” after entering the number.

If a number exceeding 100% is entered and “ENT” is pressed, it is deemed as input error and user will be prompted to re-enter the number.

If a number from 1 to 49% is entered and “ENT” is pressed, it will automatically be converted to 50%.

The block will not be illuminated when turning on LED if the dimming rate is set at 0%.

Press “CLR” to clear the entered value.

Press “BS” to delete 1 last character of the number entered last.

Press “ESC” to cancel the input.

Press “ENT” key and set the dimming rate on keyboard to display 2 keys to the right of the screen.

Program Setup		Program Nb. * *	
<input type="button" value="←"/>	<input type="button" value="→"/>		
No.	LED HEAD	No.	
1	<input type="checkbox"/>	*** %	%
2	<input type="checkbox"/>	*** %	%
3	<input type="checkbox"/>	*** %	%
4	<input type="checkbox"/>	1	2
5	<input type="checkbox"/>	3	4
6	<input type="checkbox"/>	5	ESC
	<input type="checkbox"/>	6	CLR
	<input type="checkbox"/>	7	ENT
	<input type="checkbox"/>	8	
	<input type="checkbox"/>	9	
	<input type="checkbox"/>	0	BS

Turn on the LED
 Turn off the LED

Dimming rate input screen

(3) “Confirm” key

Press this key to finalize the entered dimming rate.

(4) “Cancel” key

Press this key to discard the entered dimming rate and restore the state before modification.

(5) “END” key

Press this key to finish dimming rate setting, save the set dimming rate in memory, and return to the previous screen.

Please note that the set dimming rate data will not be saved in memory if the device is powered off before pressing this “finish” key.

Program Setup		Program Nb. * *	
<input type="button" value="←"/>	<input type="button" value="→"/>		
No.	LED HEAD	No.	
1	<input type="checkbox"/>	*** %	%
2	<input type="checkbox"/>	*** %	%
3	<input type="checkbox"/>	*** %	%
4	<input type="checkbox"/>	*** %	%
5	<input type="checkbox"/>	*** %	%
6	<input type="checkbox"/>	*** %	%

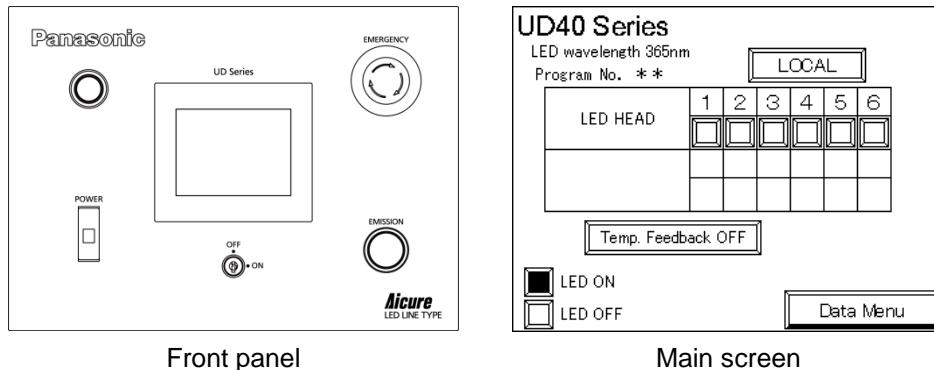
Turn on the LED
 Turn off the LED

Dimming rate confirmation, cancel screen

5) Operation of device

4. Manual operation

Allows for manual operation of UD40 controller when in "LOCAL" state on main screen.



Description on each key

The following actions will be taken when switches and keys on touch screen in the front panel of control unit are pressed.

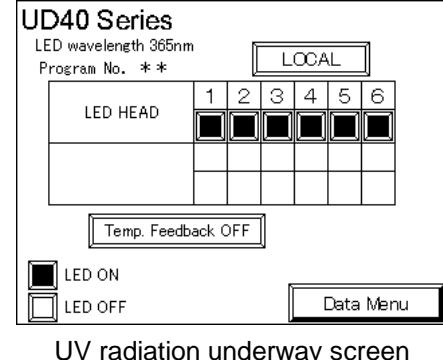
(1) "EMISSION" switch

Press this switch to light LED head under radiation conditions for the selected program No.

The lamp of this switch is lit while LED is on.

Press the switch again while LED is on to turn off LED and the lamp goes off as well.

Displays lit LED blocks while LED radiation is on, as illustrated in the bottom left corner of screen.



(2) "Program No." key

Touch the number field of "program No." to display keyboard on screen and enable entry of program No.

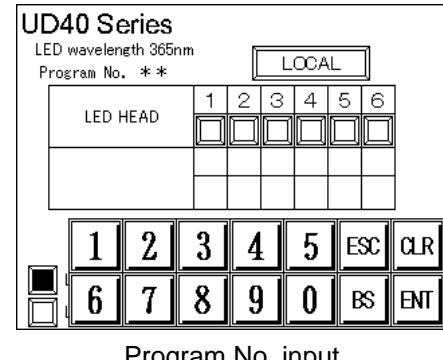
Keyboard allows entry of program No. from 0 to 31, and the program No. will be finalized by pressing "ENT" after entering the number.

If a number other than 0 to 31 is entered and "ENT" is pressed, it is deemed as input error, user will be prompted to re-enter the number, and program No. will not be finalized.

Press "CLR" to clear the entered value.

Press "BS" to delete 1 last character of the number entered last.

Press "ESC" to cancel the input.



5) Operation of device

5. Operation by external signal

UD40 controller can be controlled by external devices by sending signals into "External I/O" connector on the back side of control unit.

1. Pin-out and descriptions for External I/O connector (D-Sub37)

Pin No.	I/O	Signal name	Content
1	INPUT	Local / remote switching	Enable external signal control (remote control) when ON ^{*1}
2		LED lighting	Light LED head under selected program conditions when ON ^{*1}
3		Program No. change pulse	Modify program No. by one-shot ON ^{*2} signal.
4		Program No. bit - 0	Designate LED lighting program No. Set program No. with total of 5 bits (32 ways).
5		Program No. bit - 1	
6		Program No. bit - 2	
7		Program No. bit - 3	
8		Program No. bit - 4	
9		LED - 1 ON	Light block 1 of LED head when ON ^{*1}
10		LED - 2 ON	Light block 2 of LED head when ON ^{*1}
11		LED - 3 ON	Light block 3 of LED head when ON ^{*1}
12		LED - 4 ON	Light block 4 of LED head when ON ^{*1}
13		LED - 5 ON	Light block 5 of LED head when ON ^{*1}
14		NC	Not connected. (not used.)
15		Reserve input - 1	Reserve input
16		Reserve input - 2	Reserve input
17		External emergency stop - 1	Device goes to emergency stop when OPEN. (Dry contacts independent from other signals must be used for his signal.)
18		External emergency stop - 2	
19		Common input	Common for Nos. 1 to 16 signals (for input)
20-28		NC	Not connected. (not used.)
29	OUTPUT	Equipment power ON	ON ^{*3} when power is fed to device (ON ^{*3} to be maintained upon occurrence of errors as well)
30		LED radiation ready	ON ^{*3} when LED radiation is possible (OFF ^{*4} during radiation on all blocks, at the time of errors)
31		LED radiation underway	ON ^{*3} at the time of LED radiation (OFF ^{*4} only when lights are off on all blocks)
32		Warning	ON ^{*3} when LED or fan reaches end of life warning status
33		Occurrence of equipment error	OFF ^{*4} at the time of device errors (content of error to be checked on touch screen)
34		Equipment main unit under emergency stop	OFF ^{*4} upon emergency stop on device's main unit
35		Reserve output - 1	Reserve output
36		Reserve output - 2	Reserve output
37		Common output	Common for Nos. 29 to 36 signals (for output)

*1 Shorted with common input

*2 One-shot pulse with 0.3sec or longer shorting with common input

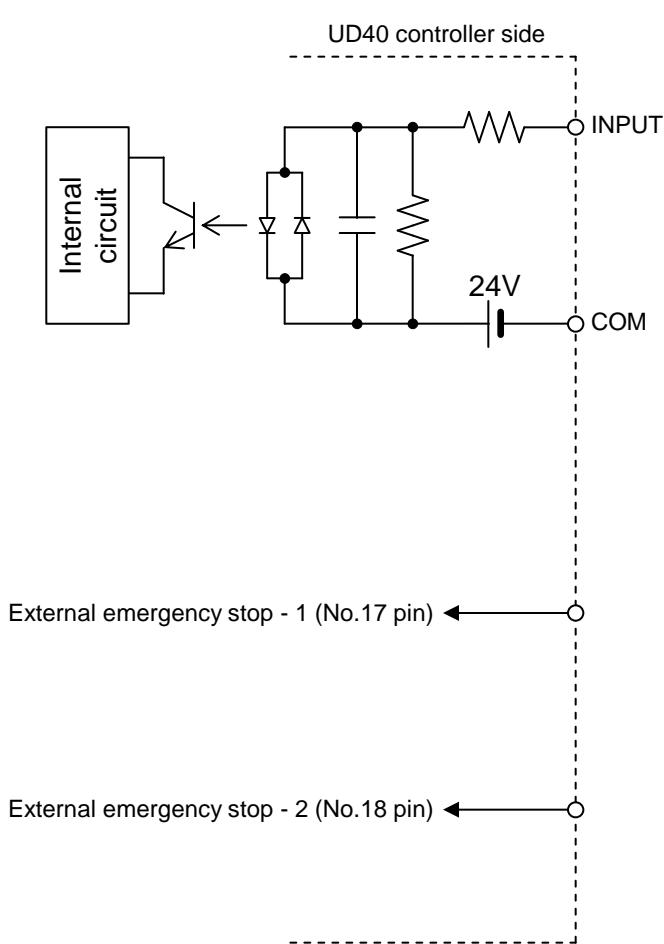
*3 Shorted state with common output

*4 Open state with common output

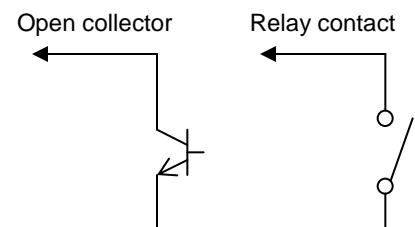
5) Operation of device

2. Input and output specifications

●Input specifications

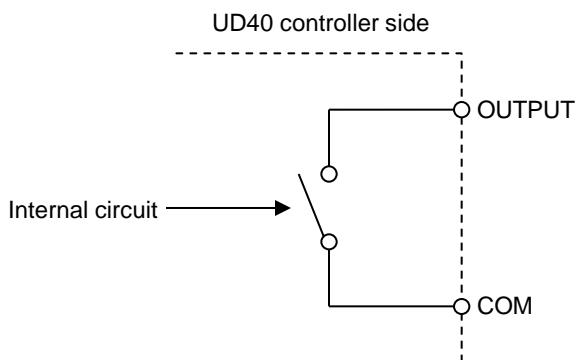


Connection example



[Caution] Rated input voltage: 24V
Maximum input current: 10mA

●Output specifications



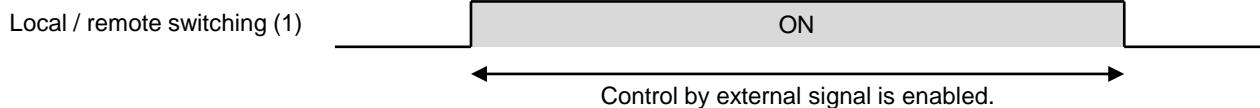
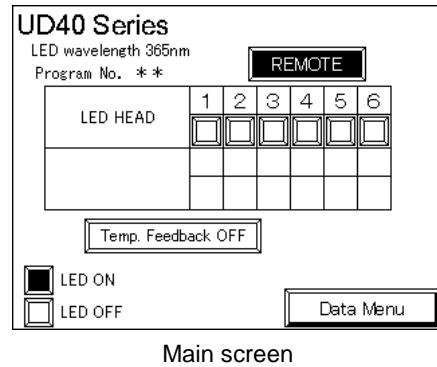
[Caution]
Output type : Relay contact output
Maximum rated voltage : 30V DC
Maximum rated amperage : 1A DC

5) Operation of device

3. Action sequence

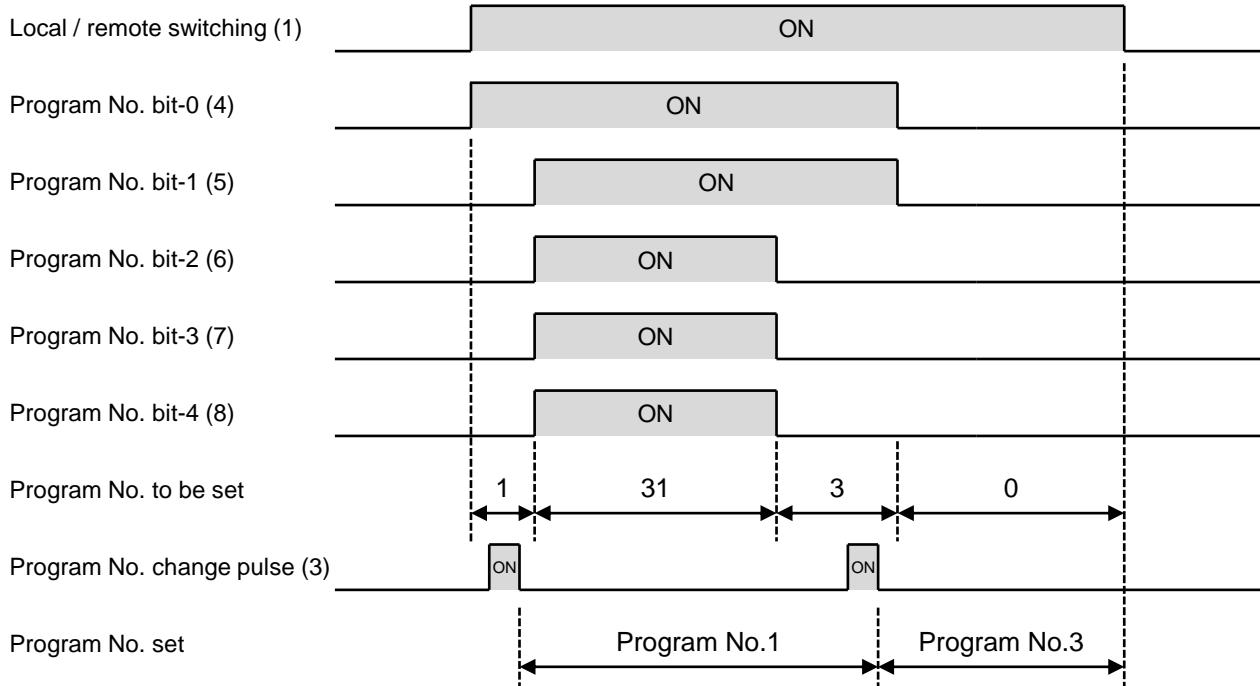
(1) Switching to “REMOTE” mode

By turning #1 pin of D-Sub37 connector to ON, UD40 controller switches to “REMOTE” mode, where “REMOTE” display appears on main screen and control by signals from D-Sub37 connector is enabled.



(2) Changing program No.

Program No. can be modified by setting the program No. to be selected with the 5 bits of #4 to 8 pins of D-Sub37 connector and feeding one-shot pulse signal of 0.3 second or longer to #3 pin.



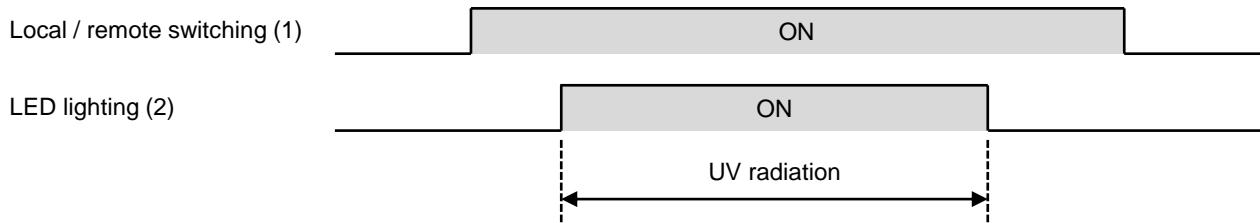
Items to note)

Program No. will no be changed by just modifying the 5 bits of #4 to 8 pins of D-Sub37 connector.
Modification of program No. cannot be done without feeding one-shot pulse signal of 0.3 second or longer to #3 pin.

5) Operation of device

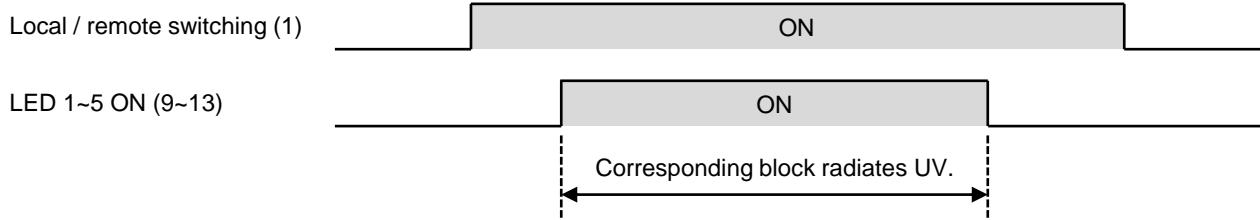
(3) Lighting LED head

LED head will be lit under the selected program conditions while #2 pin of D-Sub37 connector is ON.



(4) Individual lighting of each LED block

LED block of corresponding LED head will be lit under the selected program conditions while #9 to 13 pins of D-Sub37 connector are ON.



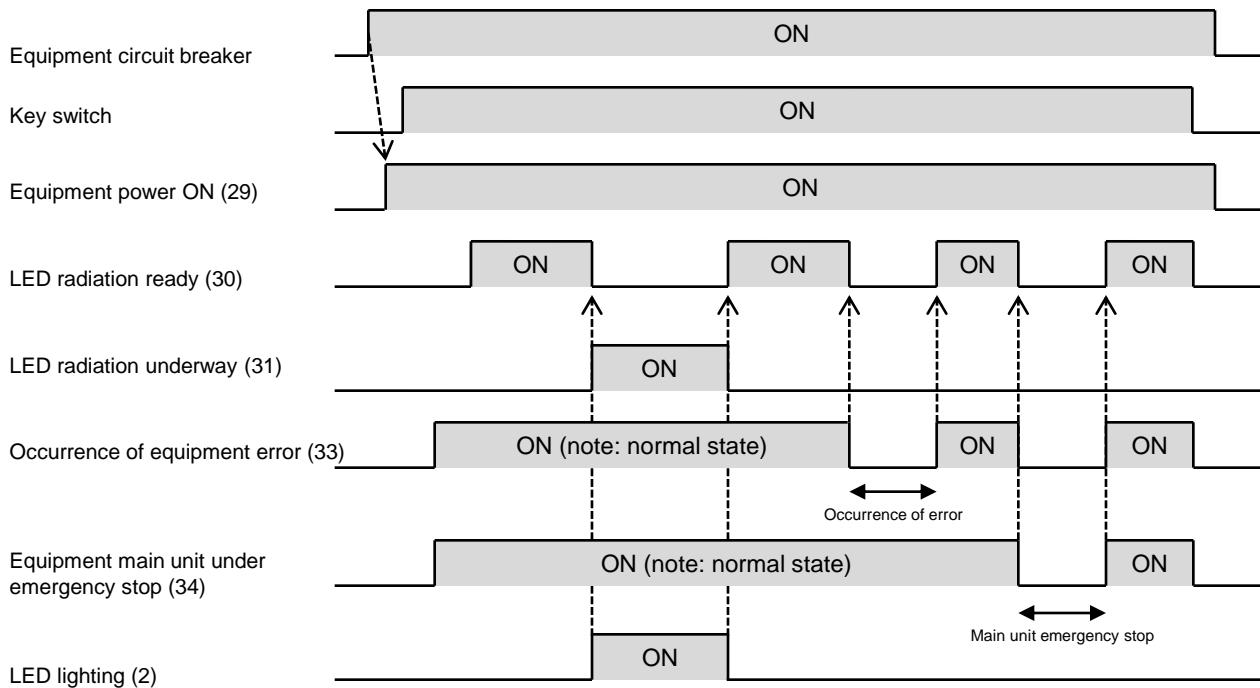
Items to note)

If the dimming rate is set to 0% (no to be lit) condition in the corresponding program condition, this signal will be ignored and LED will not be lit.

5) Operation of device

(5) Output signal

Output signals (excluding reserve output) on #29 to 34 pins of D-Sub37 connector are generated in a sequence as follows.



Items to note)

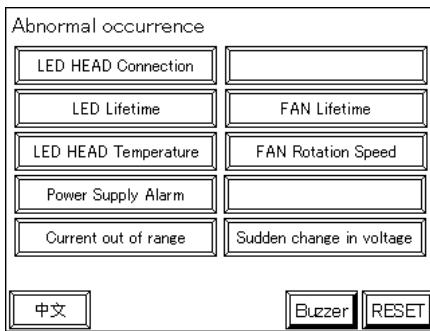
- “Equipment power ON” on #29 pin turns ON when device’s circuit breaker is ON and PLC inside the device is ready, and the ON state will be maintained until device circuit breaker is turned OFF. Use as a signal to check from external devices whether the power to UD40 controller is ON.
- “LED radiation ready” signal on #30 pin goes OFF only at the time of error occurrence during full-block radiation, and the ON state will be maintained as long as there is any LED block that can be turned ON when LEDs of individual blocks are lit.
- “Occurrence of equipment error” signal on #33 pin and “Equipment main unit under emergency stop” on #34 pin have ON signal when there is no error.
- “Occurrence of equipment error” on #33 pin goes OFF when there is an error with the system, when the emergency stop button of the main unit is pressed, and when the external emergency stop signal is lost.
- “Warning” signal on #32 pin turns ON only in the case of occurrence of warning state, and will not be affected by other signals.

6) Error display

1. Error display

Upon occurrence of errors in the device, the following screen is displayed, where error items appear in black and the buzzer beeps.

Device comes to complete halt state upon occurrence of errors.



Press “Buzzer” key to stop the buzzer.

Press “RESET” after inspecting the area of error occurrence and solving the abnormality to return to main screen by way of startup preparation screen.

When pressed the language part, can change the display language.

Press the error item key displayed in black color to jump to detailed error content display screen.

2. Error items and contents

(1) LED head connection error

This is an error that occurs when the connection of LED head cannot be confirmed.

Possible causes

- Are the connections correct between control unit, power unit, and LED head?
- Is there any snapped wire in the cables?
- Please contact our inquiry desk if this error occurs in spite of proper connection.

LED head connection error

This is an error that occurs when the connection of LED head cannot be confirmed.

Possible causes

- Are the connections correct between control unit, power unit, and LED head?
- Is there any snapped wire in the cables?
- Please contact our inquiry desk if this error occurs in spite of proper connection.

中文 ESC

LED head connection error screen

(2) LED lifetime reached

This is an error that occurs when the accumulated lighting time of LED reaches the preset lifetime.

Applicable LED blocks have the values in No. field inversed and blinking.

Please contact our inquiry desk as the LED needs to be replaced.

Reached the LED Lifetime

LED cumulative lighting time reached the setting lifetime.
(*****, * hour)
Since the LED replacement is required, please consult manufacturer.

No.	LED lighting time
1	***** . * hour
2	***** . * hour
3	***** . * hour
4	***** . * hour
5	***** . * hour
6	***** . * hour

中文 ESC

LED lifetime reached screen

6) Error display

(3) LED temperature error

This is an error that occurs when LED temperature takes an abnormal value.

Applicable LED blocks have the values in No. field inversed and blinking.

Possible causes

- Is the LED head fan working?
- Aren't the air inlet and outlet of LED head blocked?
- Isn't there any accumulation of dust around LED head?
- Isn't there any snapped wire in LED head connection cable?

LED temperature error

No.	LED Temp.
1	** . * °C
2	** . * °C
3	** . * °C
4	** . * °C
5	** . * °C
6	** . * °C

Temperature of LED is abnormal value.
(Occurred in LED block of inverted flashing number.)

Please check :
• Operating state of fan
• State around intake and exhaust port
• Conditions such as dust
• Connection between LED head

中文

ESC

LED temperature error screen

(4) Power supply error

There is an error in the power supply for lighting LED.

Applicable LED blocks have the values in No. field inversed and blinking.

Possible causes

- Isn't there any damage to LED such as snapped wire or short circuit?
- Isn't there any snapped wire in the cables?
- Please contact our inquiry desk if this error occurs at all times, which may indicate a power supply failure.

Power supply error

Power Supply No.
1
2
3
4
5
6

There is an error in the power supply for lighting LED.
(Occurred in LED block of inverted flashing number.)

Please check :
LED failure
Connection of control unit,
Power unit and LED HEAD

中文

ESC

Power supply error screen

(5) Fan lifetime reached

This is an error that occurs when the accumulated working time of LED head fan reaches the preset lifetime.

Applicable LED blocks have the values in No. field inversed and blinking.

Please contact our inquiry desk as the fan needs to be replaced.

Reached the fan Lifetime

Fan cumulative operation time reached the setting lifetime.
(** * * * * hour)
Since the fan replacement is required, please consult manufacturer.

No.	Fan operation time
1	***** . * hour
2	***** . * hour
3	***** . * hour
4	***** . * hour
5	***** . * hour
6	***** . * hour

中文

ESC

Fan lifetime reached screen

(6) Fan revolution dropping

This is an error that occurs when the revolution of LED head fan drops.

Applicable LED blocks have the values in No. field inversed and blinking.

Possible causes

- Is the LED head fan working?
- Aren't the air inlet and outlet of LED head blocked?
- Isn't there any accumulation of dust around LED head?
- Isn't there any snapped wire in LED head connection cable?

Decrease in fan rotation speed

Fan No.
1
2
3
4
5
6

Rotational speed of fan has declined.
(Occurred in LED block of inverted flashing number.)

Please check :
• Operating state of fan
• State around intake and exhaust port
• Conditions such as dust
• Connection between LED head

中文

ESC

Fan revolution dropping screen

6) Error display

(7) Current out of range error

This is an error that occurs when LED current is out of range.

Applicable LED blocks have the values in No. field inversed and blinking.

Possible causes

- Isn't there any damage to LED such as snapped wire or short circuit?
- Isn't there anomaly of power supply?
- Isn't there any snapped wire in LED head connection cable?

Current out of range

LED block No.
1
2
3
4
5
6

LED current is out of range.
(Occurred in LED block of inverted flashing number.)

Please check :
• LED
• Power supply
• Connection between LED head

中文

ESC

Current out of range error screen

(8) Sudden change in voltage error

This is an error that occurs when LED voltage has changed rapidly.

Applicable LED blocks have the values in No. field inversed and blinking.

Possible causes

- Isn't there any damage to LED such as snapped wire or short circuit?
- Isn't there anomaly of power supply?
- Isn't there any snapped wire in LED head connection cable?

Sudden change in voltage

LED block No.
1
2
3
4
5
6

LED voltage has changed rapidly.
(Occurred in LED block of inverted flashing number.)

Please check :
• LED
• Power supply
• Connection between LED head

中文

ESC

Sudden change in voltage error screen

3. Emergency stop

(1) Equipment main unit emergency stop

This screen will be displayed when the emergency stop button of the device's main unit is pressed.

Device comes to complete halt state when the emergency stop button is pressed.

To cancel emergency stop, turn the emergency stop button knob to the right and press "Cancel" key on touch panel as supported on screen. Main screen will be resumed by way of startup preparation screen.

EMERGENCY STOP

Turn the knob of the emergency stop button to the right direction, please press the "RESET"

RESET

中文

Equipment main unit emergency stop screen

(2) External emergency stop

This screen will be displayed when #17 pin and #18 pin of the external I/O connector (D-Sub37) are in open state.

Device comes to complete halt state when this state is entered.

Short #17 and #18 pins to cancel emergency stop.

Use dry contacts for the wiring for short circuits.

Main screen will be resumed by way of startup preparation screen when #17 and #18 pins are shorted.

EXTERNAL EMERGENCY STOP

Short #17 and #18 pins of external I/O connector to cancel emergency stop.

(Use dry contacts for the wiring for short circuits.)

中文

External emergency stop screen

7) Maintenance list

Check for clogging with dust in the filter inside the panel in the lower front face of power unit periodically.

See the LED head specification sheet, manual, etc. to perform appropriate maintenance on LED head.

8) Troubleshooting

In the case of suspected failures, stop using it immediately and check the following.

Phenomenon	Cause and handling
Pilot lamp of control unit is not lit.	<ul style="list-style-type: none">• Is the primary power source supplied?• Is the main circuit breaker of control unit ON?
LED fails to light when “EMISSION” switch of control unit is pressed.	<ul style="list-style-type: none">• Is the key switch ON?• Isn’t it set to “REMOTE”?
Main screen on touch panel does not show up.	<ul style="list-style-type: none">• Is the key switch ON?
Manual operation is disabled.	<ul style="list-style-type: none">• Isn’t it set to “REMOTE”?
Operation with external control is disabled.	<ul style="list-style-type: none">• Isn’t it set to “LOCAL”?

See “6) Error display” on P.35 to 37 for cases other than the above.

9) Manual revision history

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